

What's in a bivalve?

Contaminants in Oregon's coastal shellfish



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OVERALL PROGRAM GOAL

Monitor & interpret levels of toxics in Oregon's aquatic environment

PROGRAM OBJECTIVES

Statewide
Comparable
Relevant
Sustained

Oregon Bay Clamming Sites



Why monitor shellfish?

- Recreationally important
- Bio-toxin concerns
 - Mussels
 - Razor clams
 - Dungeness crab
- Coast-wide distribution
- Sessile, good indicators
- 1st coast-wide chemical monitoring in shellfish

Site Selection

- Sampling is targeted, not probabilistic
- Sites selected based on:
 - Areas of recreational use
 - NOAA mussel watch sites
 - On-going bio-toxin monitoring sites
- Coast wide distribution



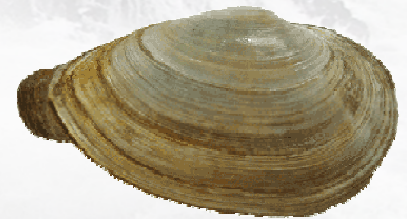
Photo courtesy of ODFW



Photo courtesy of ODFW

Species Selection

- California mussel, *Mytilus californianus*
 - Coastal edge, intertidal zone
 - Historic monitoring through NOAA's mussel watch
 - Monitored by ODA for bio-toxins
- Softshell clam – *Mya arenaria*
 - Found coast wide
 - Upper estuary, soft muddy substrate
- Olympia oyster – *Ostrea lurida*
 - Native oyster, decreasing abundance
 - On-going restoration efforts

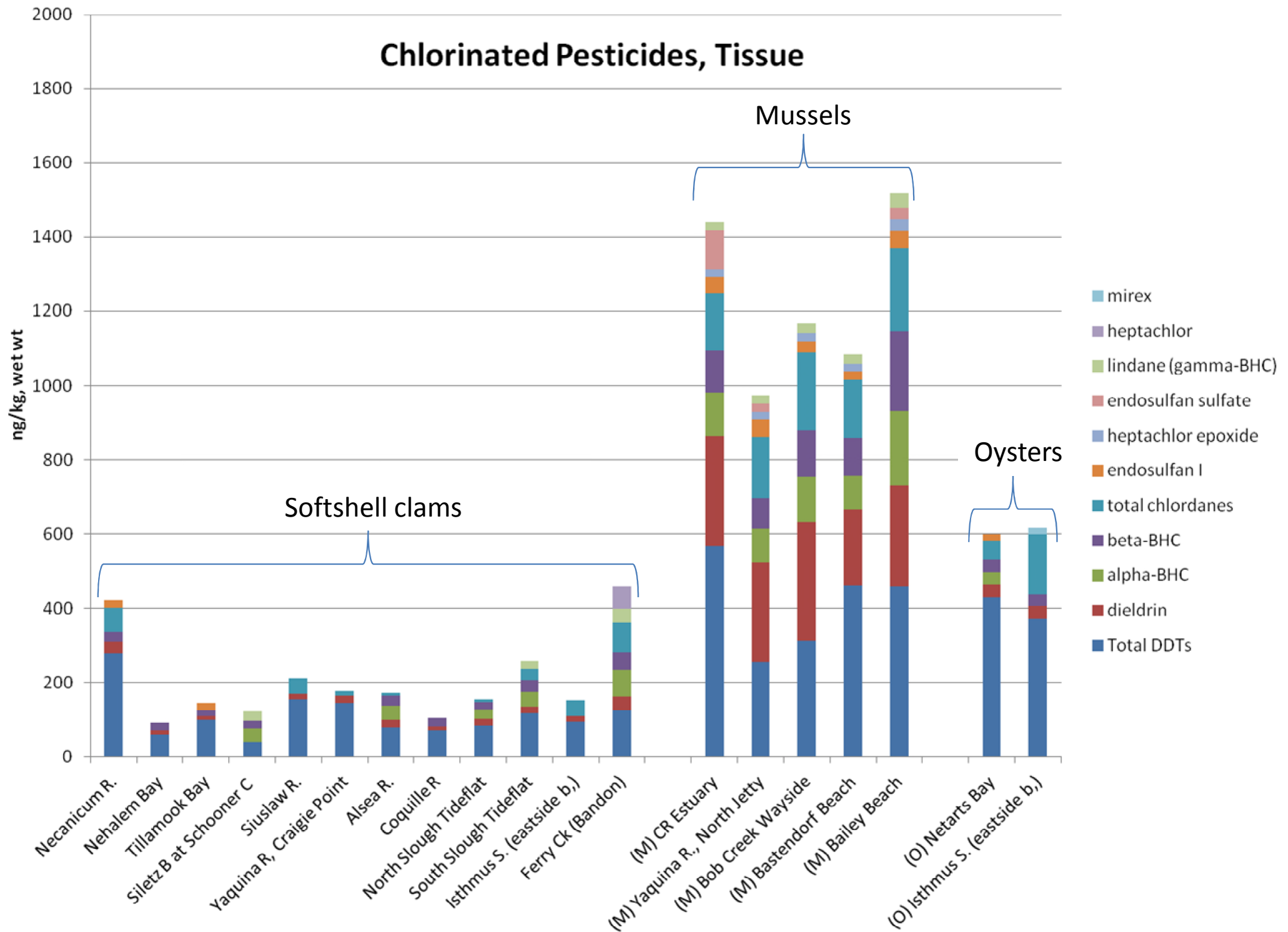


Analytical Suite

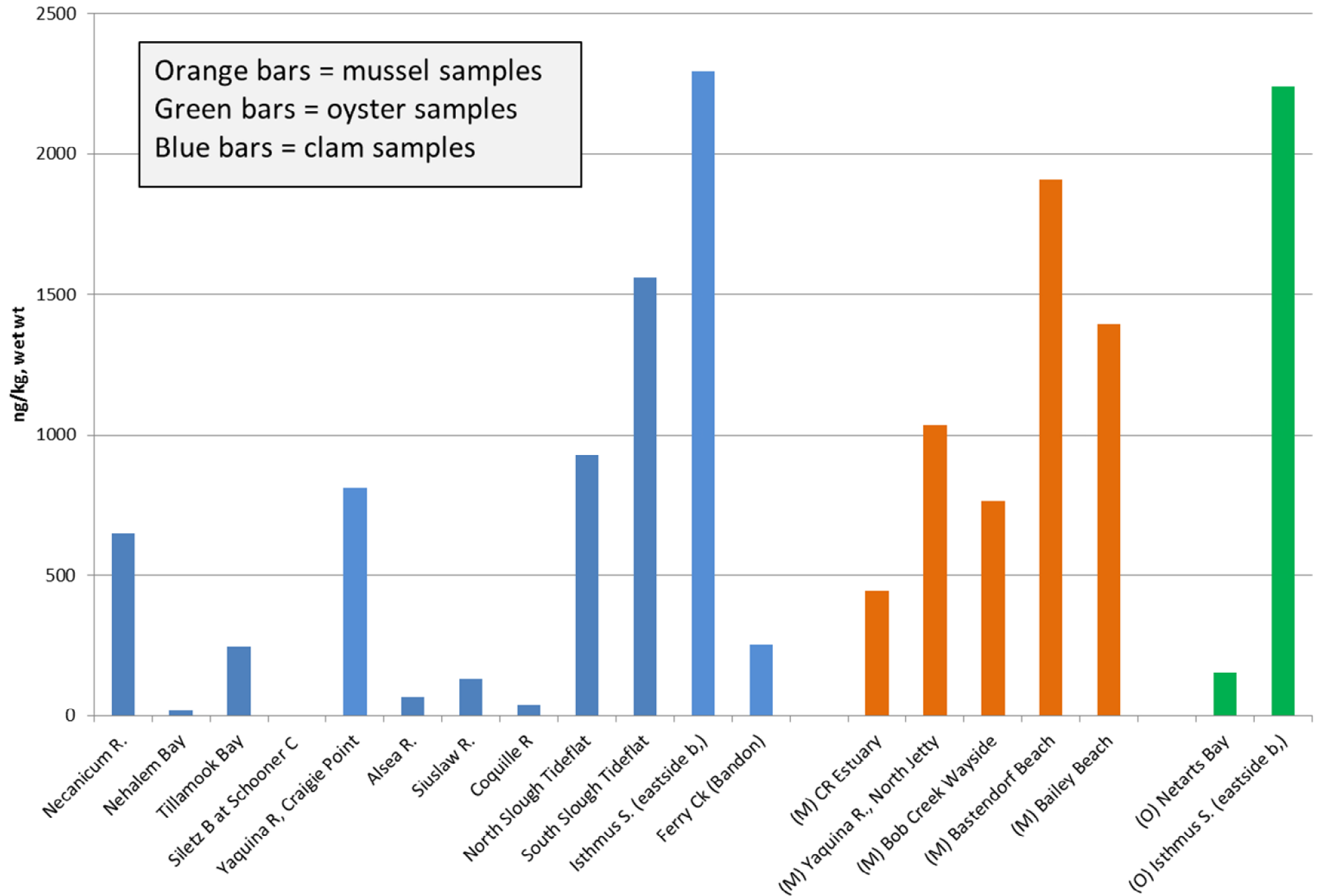
- Legacy chlorinated pesticides
- Flame retardants - PBDEs
- Metals (As, *i*As, Cd, Se, Hg)
- PCBs
- Dioxins / Furans



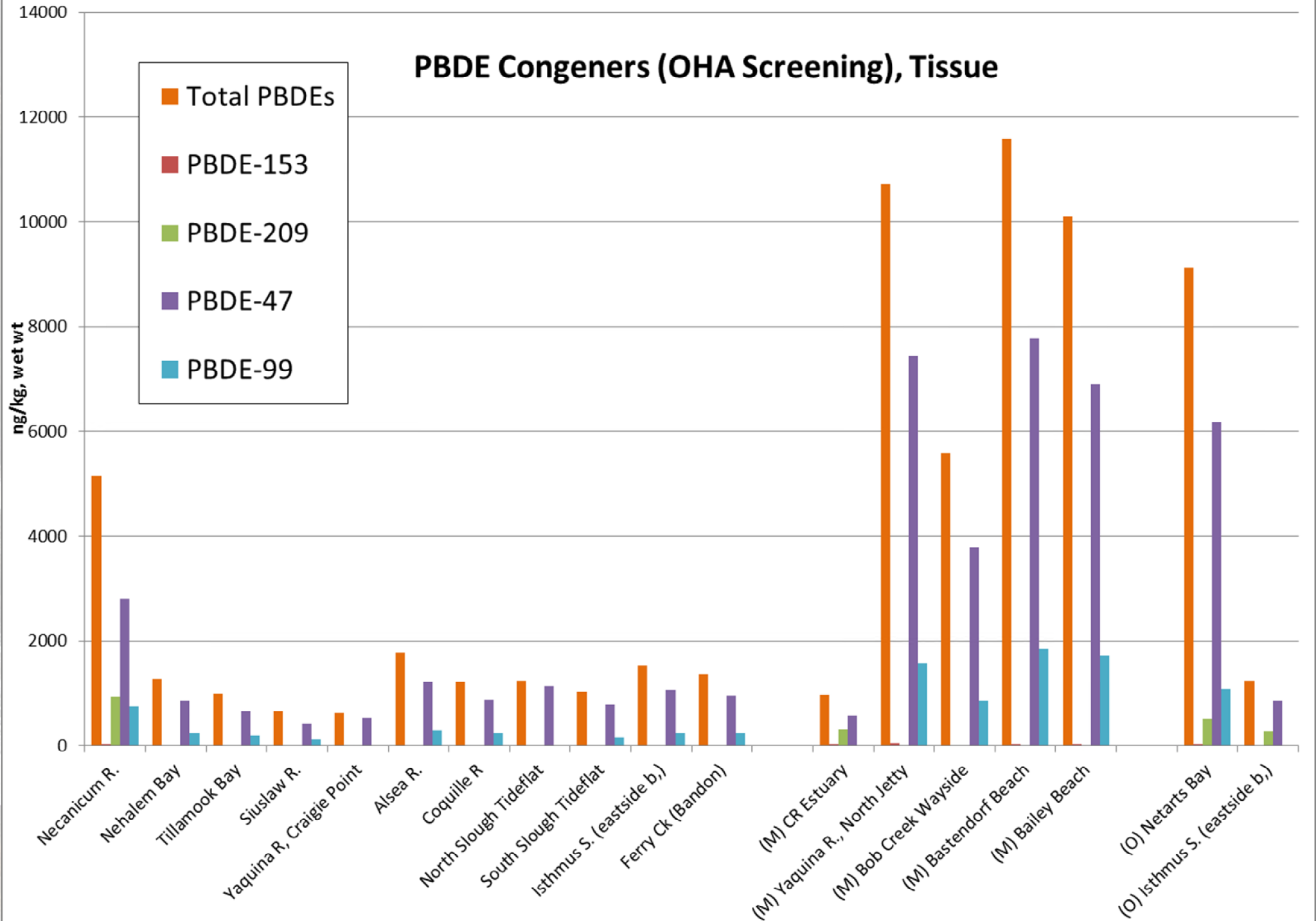
Chlorinated Pesticides, Tissue



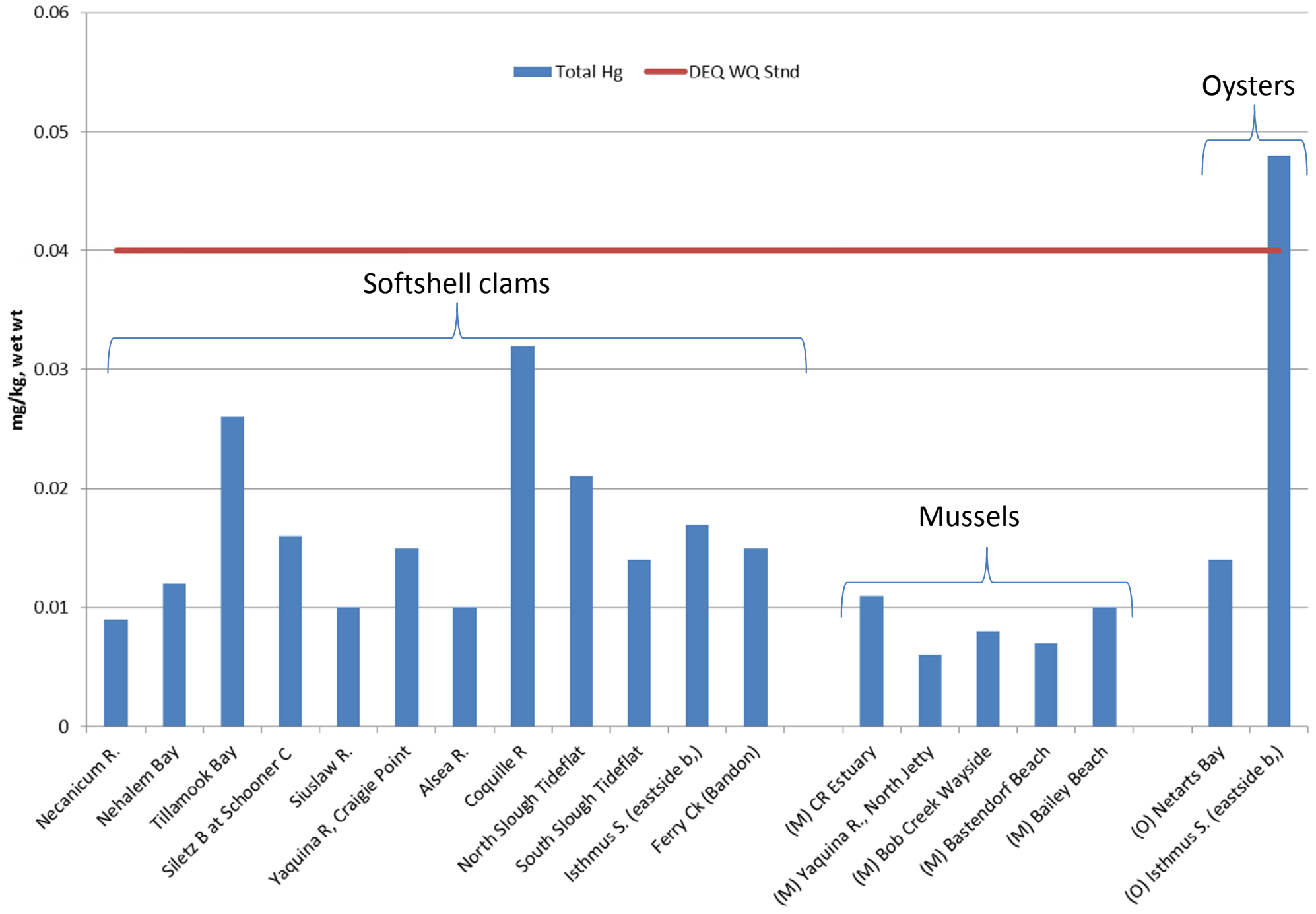
Total PCBs, Tissue



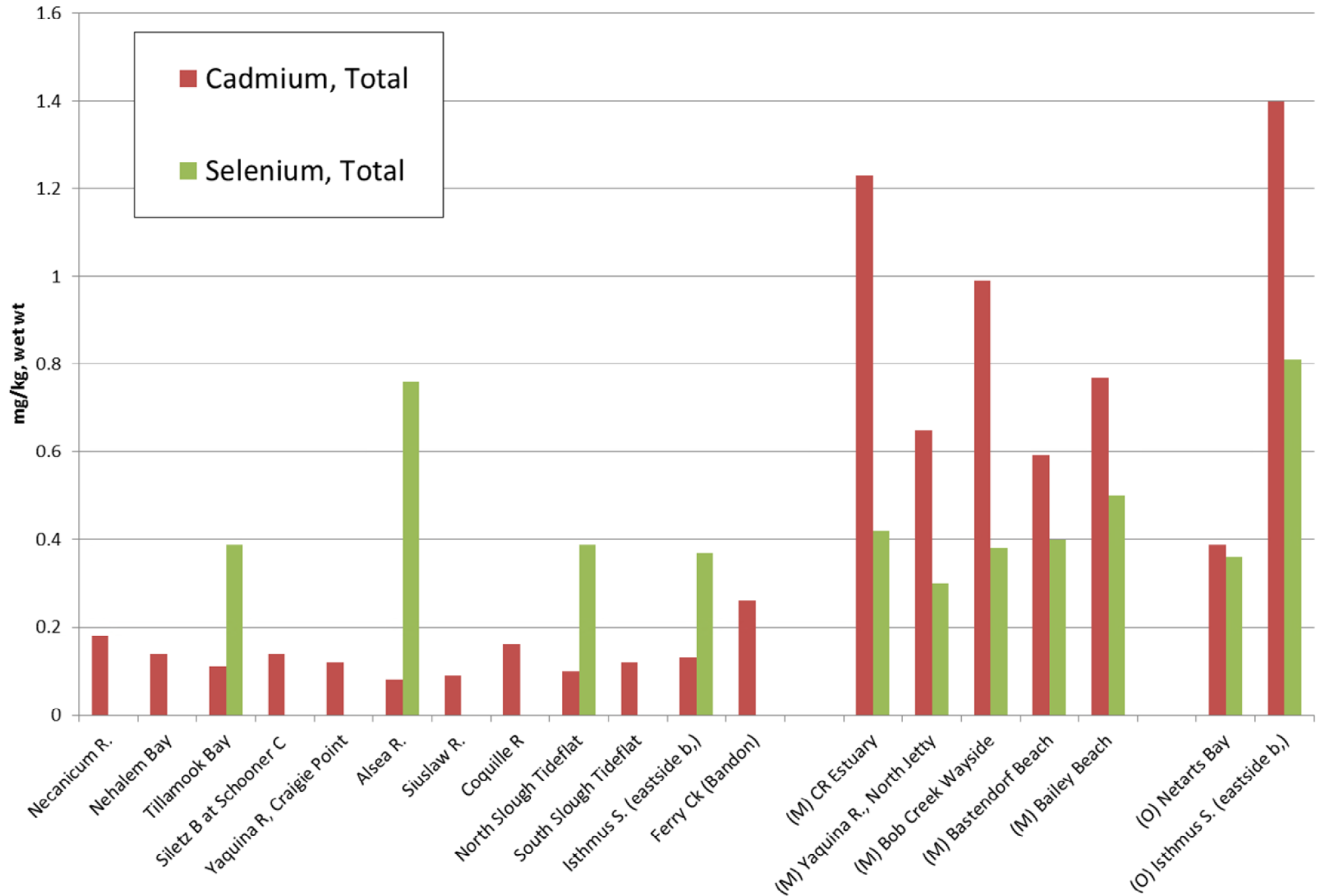
PBDE Congeners (OHA Screening), Tissue



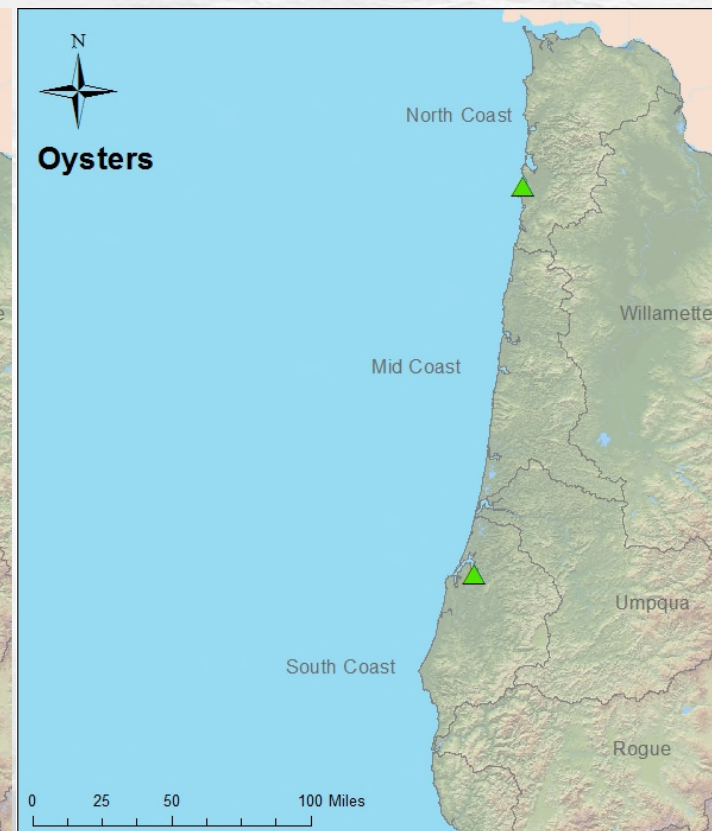
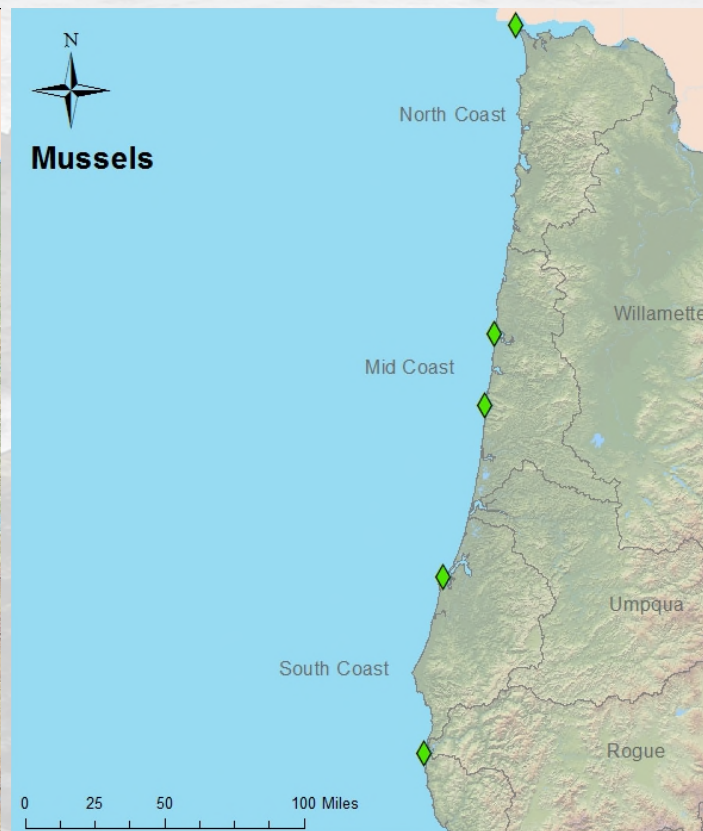
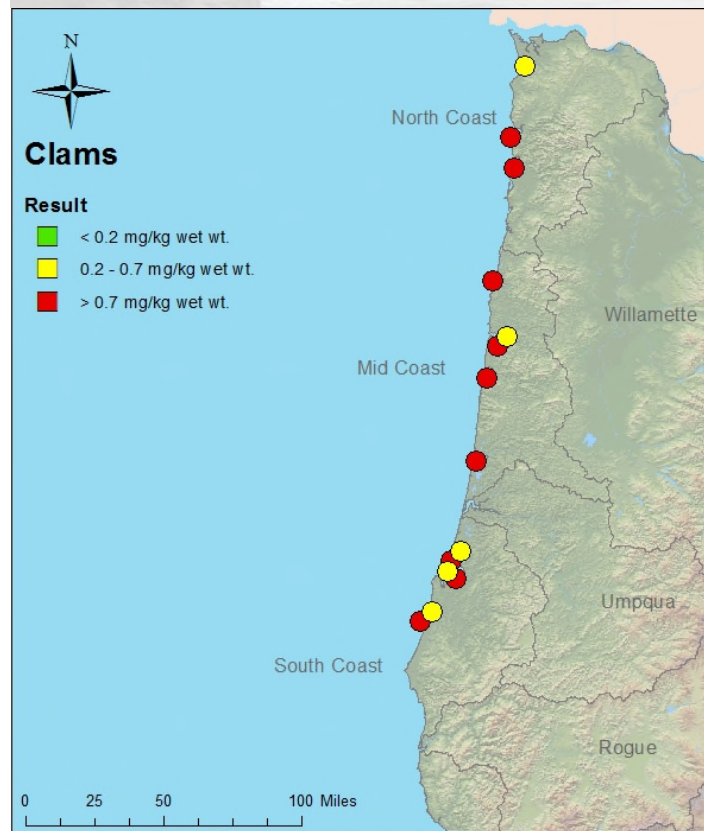
Total mercury, tissue



Cd & Se, Tissue



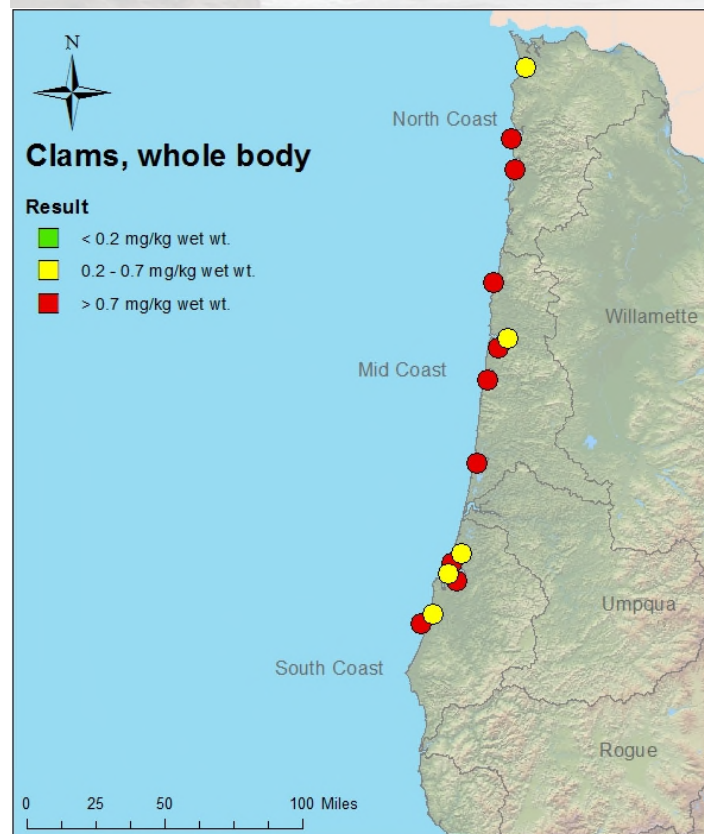
Inorganic arsenic whole body, all species



Prepared by D. Brown, DEQ 2016

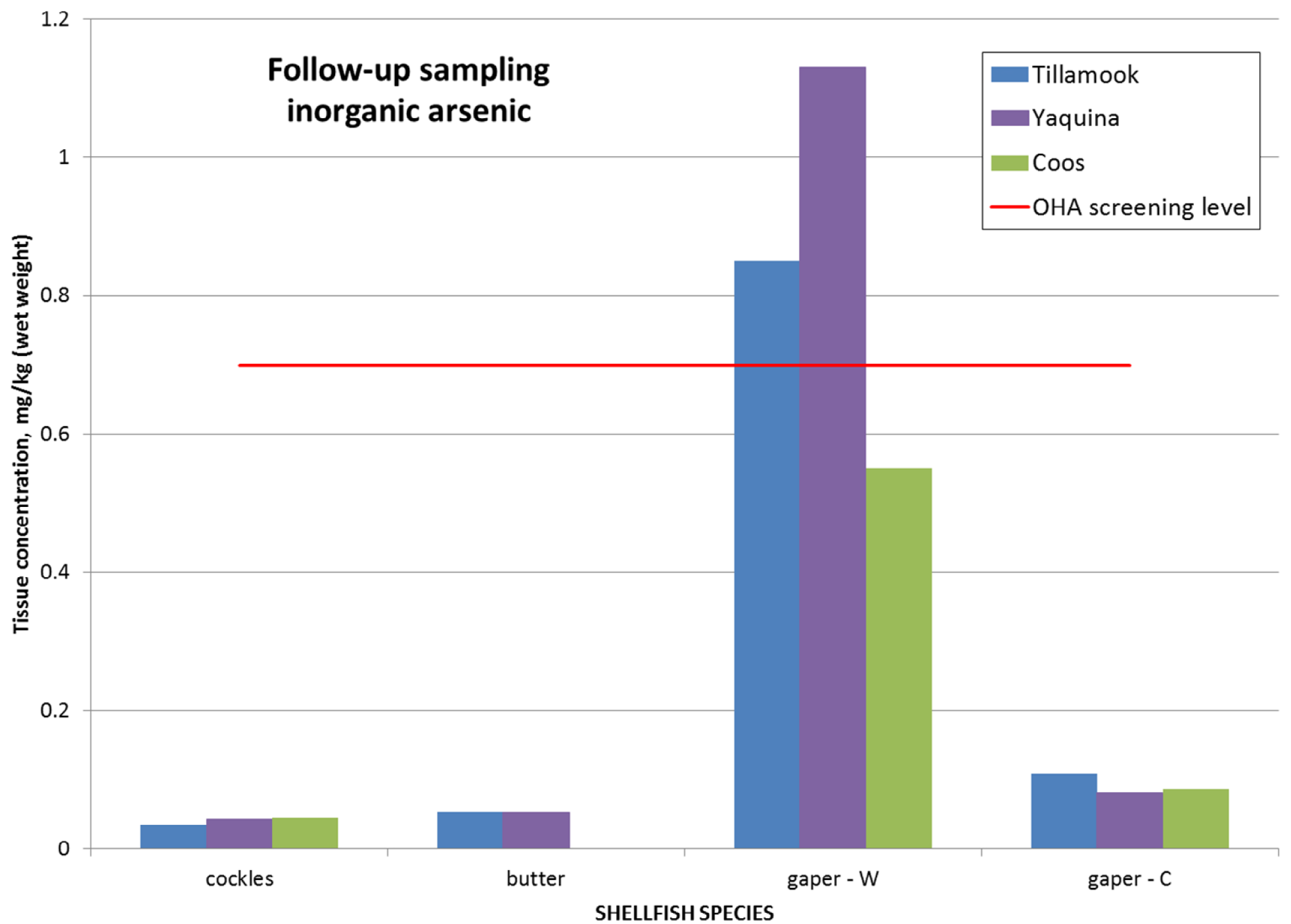
Inorganic arsenic

Softshell clams



Prepared by D. Brown, DEQ 2016

Follow-up sampling inorganic arsenic



Consumption Advisory

7/13/2015

OHA issues advisory for soft-shell clams along Oregon Coast

Removing skin from clam's siphon dramatically reduces arsenic levels, public health officials say

Significant!

First advisory for shellfish consumption for chemical contaminants along the Oregon coast

Consumption Advisory

- Inorganic arsenic
 - Softshell & gaper clams
 - Concentration varied along coastal gradient
 - Decreasing north to south
- [Oregon Health Authority advisory](#)

Take home message

Clean your softshell & gaper clams!



http://www.dfw.state.or.us/mrp/shellfish/bayclams/cleaning_softshell.asp

Resources

DEQ's WQ Toxics website

<http://www.deq.state.or.us/lab/wqm/toxics.htm>

- Final report on water
- Basin specific water reports
- Data Downloads – water, sediment, & tissue
- Reports pending on shellfish & sediment

Collaborative Work








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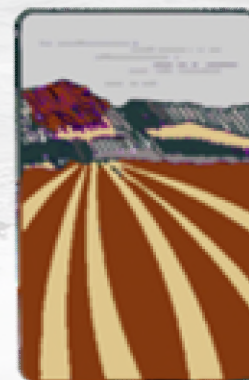


Spatial and temporal variability of contaminants within estuarine sediments and native Olympia oysters: A contrast between a developed and an undeveloped estuary

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<http://www.sciencedirect.com/science/article/pii/S0048969716304697>

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Questions?



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